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AUTHOR Donny, William F.
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ABSTRACT

In the 1960s teacher demand and supply increased rapidly to match the increasing school enrollments of those years in Pennsylvania. But due to declining enrollments and lower than normal teacher replacement needs in the 1970s the demand for teachers began to fall faster than the supply. Rather conservative projections indicate that teacher supply may well average 50 percent higher than demand in the mid-1980s. However, this oversupply is mitigated by bachelor's graduates in education consistently ranking among the top 10 of the 23 major disciplines for those with some kind of full-time employment five months after graduation. The analysis is based on extensive data relative to: population change, public school enrollment, public and nonpublic schools, and grade and age level characteristics as they relate to teacher demand; sources of teacher supply, teacher graduates, out of state teacher supply, and supply reservoirs; and the relationship of teacher demand to supply in Pennsylvania. (Author/DS)

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Teacher Demand and Supply for Elementary and Secondary Schools in Pennsylvania

Prepared by
William F. Donny
Division of Research
Bureau of Information Systems
Pennsylvania Department of Education
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Bureau of Information Systems
Seon H. Cho, *Director*

Division of Research
Robert B. Hayes, *Director*

Pennsylvania Department of Education
Box 911
Harrisburg, PA 17126

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FIGURE 1

The Effect of 13-Year Birth Cohorts on Basic Education Enrollments 3

SUMMARY

In the 1960s teacher demand and supply increased rapidly to match the increasing school enrollments of those years in Pennsylvania. But due to declining enrollments and lower than normal teacher replacement needs in the 1970s the demand for teachers began to fall faster than the supply. Rather conservative projections indicate that teacher supply may well average 50 percent higher than demand in the mid-1980s. However, this oversupply is mitigated by bachelor's graduates in education consistently ranking among the top 10 of the 23 major disciplines for those with some kind of full-time employment five months after graduation.

In more detail, teacher demand as a percent of new teacher supply has changed from 102.3 percent in 1970-71 to 69.7 in 1976-77, a 32.6 percent reduction. Demand is projected to drop to 55.5 percent in 1983-84, a further reduction of 14.2 percent.

Demand for elementary, secondary and special education teachers in public and nonpublic schools dropped from 14,882 in 1972-73 to 8,135 in 1976-77, and is projected to fall to 5,443 by 1983-84.

The new teacher supply from the colleges peaked at 19,453 in 1971-72, dropped to 11,796 in 1976-77, and is projected to fall to 9,800 by 1983-84.

Data on hiring of teachers for new and replacement positions compared with new teacher output from Pennsylvania colleges in 1976-77 show that a balance exists in the subject fields of chemistry, Latin and physics. Fields where demand was greater than teacher supply were general science, distributive education and certain specific fields in the general cluster of trade, industrial, vocational and technical courses.

Eighteen years of declining births--since 1957--in the Commonwealth have established a downward trend in school enrollments that assures a declining demand for teachers. From 254,997 in 1957 to 148,004 in 1976 is a drop of 106,993 in annual births. With public and nonpublic school enrollment of 2,880,968 in 1970-71 dropping to 2,254,576 in 1975-76 and projected to fall to 2,113,400 in 1983-84, the impact on teacher demand will be more intense in the future. The total number of teachers in the public and nonpublic schools is projected to be 14,692 fewer in 1983-84 than in 1977-78.

The projected imbalance in teacher demand and supply could moderate in a number of ways: (1) The output of new teachers from the colleges could decline at a faster rate as students get the message of the teacher surplus, (2) academic requirements for entering the teaching profession could be raised by the colleges; and (3) if class size were reduced and new and expanded programs instituted, the downward trend of teacher demand would lessen.

Yet the shortage of tax dollars may prevent (2) and (3) above from happening, and the trend for the past three years indicates that (1) above is not occurring.

TEACHER DEMAND

The dramatic increases in teacher demand that occurred annually in Pennsylvania in the 1960s peaked in 1970. Since then the demand for teachers has fallen faster than the supply, leaving the Commonwealth an annual oversupply of teachers. This report focuses on this continuing imbalance between demand for and supply of teachers in the 1970s and beyond.

This oversupply of teachers is also a national problem, as indicated by the following article excerpted from the October 4, 1978, Shamokin News-Item.

> For reasons which defy rational understanding, American colleges continue to graduate upwards of 80,000 more teachers each year than there are jobs available for them. The national surplus of teachers now is about one-half million.
>
> The plight of the teachers is a direct result of the population decline. In the last decade, about 11,000 grade and high schools have closed because of dwindling enrollments. The number of students in the last five years declined more than two million.
>
> Nothing on the horizon indicates that trend will be reversed in the near future. To the contrary, the full effect has not yet been felt at the high school level.

Purpose of the Study

This report provides useful perspective on the past, present and future of the imbalance of Pennsylvania's teacher demand and supply. Much of the basic data in this report are from recent publications of the Pennsylvania Department of Education.

Population Change and Teacher Demand

The number of teachers employed each year depends largely on the number of students enrolled or anticipated. Enrollments, in turn, depend on preceding birth rates. The increasing school enrollments during the 1960s, due to the effects of the postwar baby boom, called for corresponding increases in the statewide teaching staff. Although enrollments began to decline after they peaked at 2,887,971 students in 1969-70, small increases continued in the teaching staff until its peak year of 1975-76 when 137,227 public and nonpublic school teachers were employed in Pennsylvania.

In spite of these small annual increases in teacher employment, which continued through 1975, a sharp decline began in 1970 in the number of teachers needed each year to replace others withdrawing from the profession due to marriage, illness, retirement, death, and the like. This dramatic drop in the need for replacement teachers resulted from the relative youth of teachers employed in the 1960s. Even though teacher supply began to diminish by 1973, the present oversupply is expected to continue into the 1980s, due to the smaller replacement needs and recent reductions in teacher staff resulting from falling enrollments.

Both Figure 1 and Table 1 illustrate the effect of annual live births on enrollments. The reader also may wish to examine Table 15, at the end of this report, since this table gives Pennsylvania resident live births from 1916 to present.

Table 1

Relation of Pennsylvania Resident Births to School Enrollment

Cohort Year	Births in Cohort[a]	Cohort Decline from 1970-71	Enrollment Data			Percentage of Birth Cohort Enrolled			Enrollment Changes from 1970-71		
			Public Schools	Nonpublic Schools	Public + Nonpublic	Public School	Nonpub. Schools	Public + Nonpub.	Public School	Nonpublic School	Public + Nonpublic
1970-71	3,078,580		2,363,817	517,151	2,880,968	76.8	16.8	93.6			
1971-72	3,035,243	- 43,337	2,370,665	486,827	2,857,492	78.1	16.0	94.1	6,848	- 30,324	- 23,476
1972-73	2,978,428	-100,152	2,361,285	456,102	2,817,387	79.3	15.3	94.6	- 2,532	- 61,049	- 63,581
1973-74	2,921,566	-157,014	2,321,437	443,995	2,765,432	79.5	15.2	94.7	- 42,380	- 73,156	-115,536
1974-75	2,858,593	-219,987	2,277,451	433,392	2,710,843	80.0	15.2	94.8	- 86,366	- 83,759	-170,125
1975-76	2,795,750	-282,830	2,246,218	427,969	2,674,187	80.3	15.3	95.7	-117,599	- 89,182	-206,781
1976-77	2,726,879	-351,701	2,193,673	424,054	2,617,727	80.5	15.6	96.0	-170,144	- 93,097	-263,241
1977-78	2,643,374	-435,206	2,128,873	416,703	2,545,576	80.5	15.8	96.3	-234,944	-100,448	-335,392
	Projections[b]										
1978-79	2,555,547	-523,033	2,058,000	406,900	2,464,900	80.5	15.9	96.5	-305,817	-110,251	-416,068
1979-80	2,466,833	-611,747	1,987,300	395,500	2,382,800	80.6	16.0	96.6	-376,517	-121,651	-498,168
1980-81	2,389,382	-689,198	1,921,400	385,000	2,306,400	80.4	16.1	96.5	-442,417	-132,151	-574,568
1981-82	2,315,849	-762,731	1,856,000	374,900	2,230,900	80.1	16.2	96.3	-507,817	-142,251	-650,068
1982-83	2,250,749	-827,831	1,799,300	366,900	2,166,200	79.9	16.3	96.2	-564,517	-150,251	-714,768
1983-84	2,201,709	-876,871	1,753,300	360,100	2,113,400	79.6	16.4	96.0	-610,517	-157,051	-767,568

[a] Births in each 13-year period constitute the cohort in annual school enrollment, e.g., 1960-72 cohort provided enrollment for 1977.

[b] Projections, Selected Education Statistics for Pennsylvania to 1987-88, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978.

FIGURE 1

THE EFFECT OF 13-YEAR BIRTH COHORTS ON BASIC EDUCATION ENROLLMENTS
(IN MILLIONS)

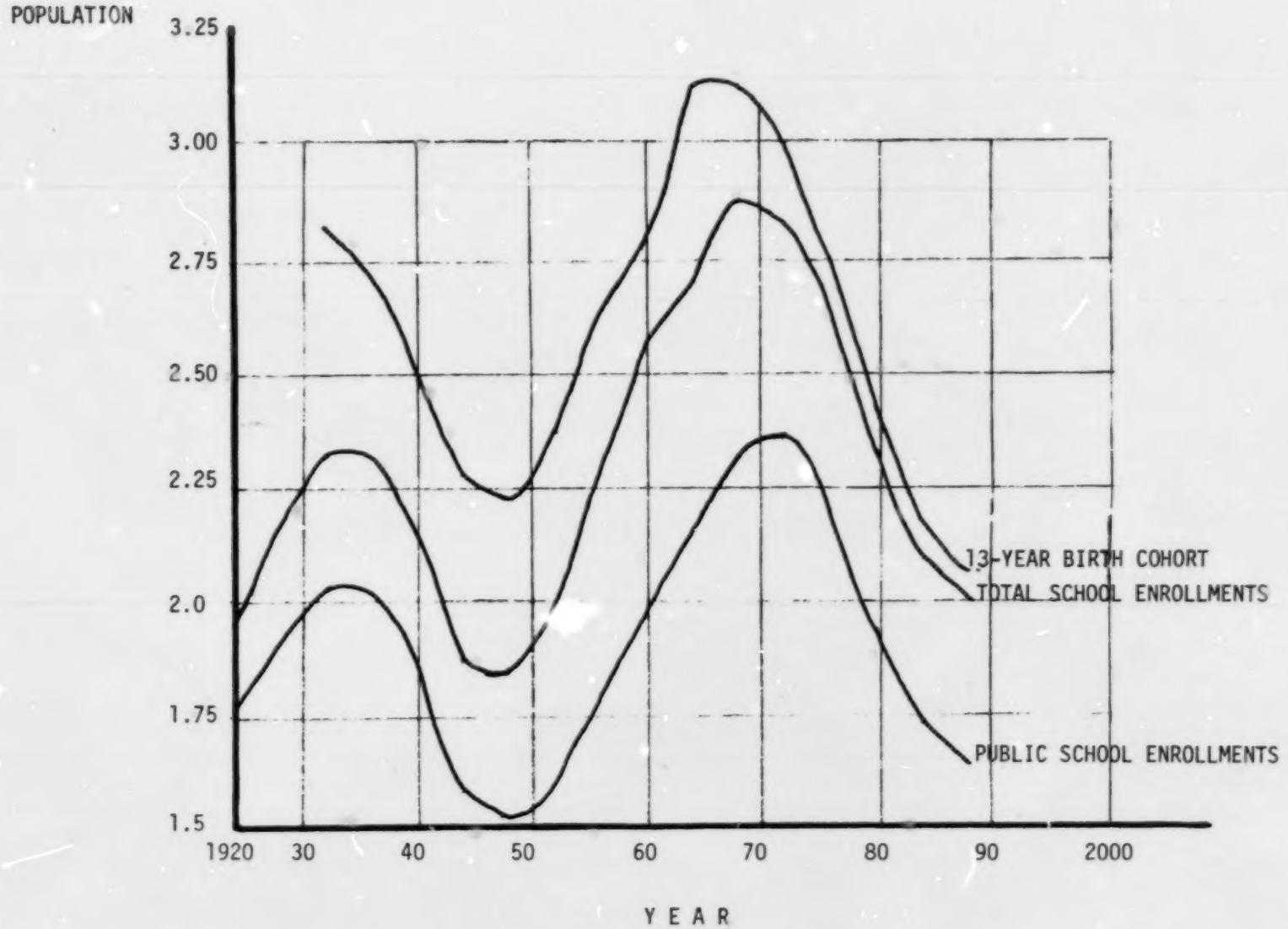

Table 2

Pennsylvania Public Enrollment by Grade with Decrease in Enrollment

	1977-78[a]	Projections[c] 1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Enrollment Decrease 1977-84
K	140,440	131,200	129,300	127,000	125,900	130,300	131,400	9,040
1	151,775	135,800	127,500	125,900	123,700	122,800	127,100	24,675
2	147,594	141,200	126,300	118,600	117,100	115,000	114,200	33,394
3	141,585	144,100	137,800	123,300	115,800	114,300	112,300	29,285
4	140,466	139,500	142,000	135,900	121,600	114,100	112,700	27,766
5	144,976	139,600	138,700	141,200	135,100	120,900	113,400	31,576
6	150,690	144,600	139,200	138,300	140,800	134,700	120,500	30,190
7	164,299	155,400	149,200	143,600	142,700	145,300	139,000	25,299
8	171,866	162,900	154,100	147,900	142,400	141,400	144,100	27,766
9	183,933	181,400	171,900	162,600	156,100	150,300	149,400	34,533
10	184,147	183,100	180,700	171,200	161,900	155,500	149,700	34,447
11	175,190	168,200	167,400	165,100	156,400	148,000	142,000	33,190
12	162,557	161,500	155,000	154,300	152,100	144,100	136,400	26,157
Postgrad.	347	400	400	400	300	300	300	47
Sp. Ed. Elem.	36,506	36,100	35,300	34,400	33,400	32,300	31,500	5,006
Sp. Ed. Sec.	32,502	33,000	32,500	31,700	30,700	30,000	29,300	3,202
TOTAL[b]	2,128,873	2,058,000	1,987,300	1,921,400	1,856,000	1,799,300	1,753,300	375,573

[a]Our Schools Today, Public Elementary-Secondary School Report, 1977-78, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p.8.

[b]Total Enrollment from Table 1.

[c]Projections: Selected Educational Statistics for Pennsylvania to 1987-88, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, 1978, p.8.

Table 3

Projected Total Public Classroom Teachers by Grade

	1977-78[a]		1978-79[b]	1979-80	1980-81	1981-82	1982-83	1983-84	Decrease 1975-81
K	6,954		6,827	6,704	6,618	6,550	6,548	6,532	422
1	7,514		7,378	7,244	7,151	7,078	6,892	6,875	639
2	7,308		7,175	7,046	6,955	6,884	6,704	6,509	799
3	7,010		6,882	6,758	6,672	6,603	6,430	6,233	777
4	6,955		6,828	6,705	6,619	6,551	6,379	6,184	771
5	7,178		7,047	6,920	6,831	6,761	6,584	6,384	794
6	7,461		7,325	7,193	7,101	7,027	6,844	6,637	824
7	8,258	Projections	8,108	7,962	7,859	7,778	7,577	7,349	909
8	8,638		8,481	8,328	8,221	8,136	7,926	7,690	948
9	9,245		9,077	8,913	8,799	8,708	8,483	8,234	1,011
10	9,256		9,088	8,924	8,809	8,718	8,494	8,243	1,013
11	8,806		8,646	8,490	8,381	8,294	8,080	7,841	965
12	8,171		8,022	7,878	7,776	7,697	7,497	7,271	900
Sp. Ed. Elem.	4,178		4,102	4,028	3,976	3,935	3,834	3,727	451
Sp. Ed. Sec.	3,720		3,652	3,586	3,540	3,509	3,413	3,333	387
Dept. Heads	1,091		1,071	1,052	1,038	1,028	1,002	974	117
Speech	1,213		1,191	1,169	1,154	1,143	1,113	1,084	129
Total	112,956		110,900	108,900	107,500	106,400	103,800	101,100	11,856
% Change			1.8	1.8	1.3	1.0	2.4	2.6	

[a]Classroom teachers for 1977-78 were derived by dividing grade level enrollments by student-classroom teacher ratios for that year as follows: elementary 20.19; secondary 19.89; special education 8.73. Basic data were from the three following Pennsylvania Department of Education statistical reports (1) Public Elementary and Secondary School Report 1977-78, (2) Professional Personnel Report 1977-78, and (3) Projections, Selected Education Statistics for Pennsylvania to 1987-88.

[b]Classroom teachers in the projections are distributed using the same proportion as found for 1977-78.

Table 1 shows further that total enrollments declined steadily since 1970, and by 1983 the total loss in students will amount to 610,517 public students and 157,051 nonpublic (compared to 1970).

Figure 1 shows the interdependence between the cumulative 13-year school age cohorts and the public and nonpublic school enrollments for a 60-year period.

Close inspection of Figure 1 reveals the increasing holding power of the schools, as shown by the gradual convergence of enrollments with school age cohorts between 1933 and 1977. The percentages of school age cohorts enrolled in public and nonpublic schools grew from 82.9 in 1933 to 96.3 in 1977.

Public School Enrollment, Teachers Employed, 1977-83

Table 2 gives public school enrollments by grade level for 1977-78 and projects them annually through 1983. An overall enrollment decline of 375,573 (17.6 percent) students is projected during the years 1977 to 1983.

Table 3, on the other hand, gives the number of public school teachers employed at each grade level for 1977-78 and projects teacher employment levels through 1983. Teacher employment is anticipated to decline by 11,856 (10.5 percent) positions by 1983.

The differential declines projected for 1983 in Tables 2 and 3 of -17.6 percent for enrollment and -10.5 percent for teachers will result in a slight drop in the number of students per teacher. These student to teacher ratios by grade level and year are detailed in Table 4. These projected teacher ratios do not in any way reflect what should happen but rather what is likely to occur, since it is difficult to reduce the number of teachers as enrollment declines.

Table 4

Public School Pupil-Teacher Ratios[a]

	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Change
K	20.2	19.2	19.3	19.2	19.2	19.9	20.1	-0.1
1	20.2	18.4	17.6	17.6	17.5	17.8	18.5	-1.7
2	20.2	19.7	17.9	17.1	17.0	17.2	17.5	-2.7
3	20.2	20.9	20.4	18.5	17.5	17.8	18.0	-2.2
4	20.2	20.4	21.2	20.5	18.6	17.9	18.2	-2.0
5	20.2	19.8	20.0	20.7	20.0	18.4	17.8	-2.4
6	20.2	19.7	19.4	19.5	20.0	19.7	18.2	-2.0
7	19.9	19.2	18.7	18.3	18.3	19.2	18.9	-1.0
8	19.9	19.2	18.5	18.0	17.5	17.8	18.7	-1.2
9	19.9	20.0	19.3	18.5	17.9	17.7	18.1	-1.8
10	19.9	20.1	20.2	19.4	18.6	18.3	18.1	-1.8
11	19.9	19.5	19.7	19.7	18.9	18.3	18.1	-1.8
12	19.9	20.1	19.7	19.8	19.8	19.2	18.8	-1.1
Sp. Ed. Elem.	8.7	8.8	8.8	8.7	8.5	8.4	8.4	-0.3
Sp. Ed. Sec.	8.7	9.0	9.1	9.0	8.7	8.8	8.8	+0.1
Total	18.8	18.6	18.3	17.9	17.4	17.3	17.3	-1.5

[a] These pupil-teacher ratios were derived by dividing enrollment (Table 2) by number of classroom teachers (Table 3).

Highlights from Table 4, summarizing these changing student-teacher ratios for regular and special education students, follow:

Public School Student-Teacher Ratios 1977-83

Group	1977-78	1978-79	1979-80	1980-81	1981-82	1982-83	1983-84
Regular Students	20.0	19.7	19.4	19.0	18.5	18.4	18.4
Sp. Ed. Students	8.7	8.9	8.9	8.8	8.6	8.6	8.6
Combined	18.8	18.6	18.2	17.9	17.4	17.3	17.3

Table 5 shows the nonpublic school enrollments by grade level for 1977-78 and projections each year through 1983. This table indicates a drop of 56,603 (13.6 percent) nonpublic school students from 1977 through 1983.

Table 6, a companion table, gives the number of nonpublic school teachers employed by grade level in 1977-78 and the number projected annually through 1983.

Teacher Demand, Public and Nonpublic Schools

Table 7 gives, for the years 1970 through 1983, totals for elementary and secondary school enrollments, totals for teacher staffs, changes in staff size, teacher replacement needs and total annual demands for teachers. Table 7 is divided into two parts, Part I for public school data and Part II for nonpublic school data.

As column (5), Part I (Table 7), indicates, public school teacher staff increased by moderate annual increments through 1975. However, by 1976 a decrease of 1,830 teachers is indicated in column (5) resulting from declining enrollments. Column 5 shows another decrease of 1,469 in total teachers employed by the public schools in 1977. When these latter positions are subtracted from the 7,923 teachers needed to replace those withdrawing from the professions, due to illness, retirement, death, etc., then a total demand for only 6,454 teachers remains.

Column (7), Table 7, shows that between 1970 and 1977 annual demand in the public schools declined by 9,239 (-54.3 percent) teachers. By 1983 this demand is projected to drop to 4,377, or -72.2 percent of the 1970 figure.

Part II of Table 7, giving nonpublic school data, shows a drop in annual demand from 2,828 nonpublic teachers in 1970 to 2,342 (-17.2 percent) teachers in 1977, and a projected drop to 1,066 (-62.3 percent) teachers in 1983.

Teaching Staff Grade Level and Age Level Characteristics

Table 8 indicates that Pennsylvania in 1978 has a relatively young teaching staff--61 percent of all teachers being in the 25-39 year age group. These teachers have a growing tenacity in holding on to their jobs. Thus, teacher replacement needs for many years will not stop the downward trend in teacher demand.

Table 9 shows that each year since 1970 smaller proportions of the total teacher complement in the state were withdrawing from the profession, reducing proportionately the number of teacher replacements needed. In 1970, 11.9 percent of the total teaching force in Pennsylvania were replacements, but by 1977 only 7.0 percent were replacements for teacher withdrawals.

Table 5

Nonpublic Enrollment by Grade with Decrease in Enrollment

	1977-78[a]		1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Enrollment Change 1977-84
K	18,815		19,600	20,300	20,500	20,800	21,900	22,500	+ 3,685
1	34,946		31,700	29,900	29,500	29,000	28,800	29,800	- 5,146
2	35,276		34,000	30,800	29,100	28,700	28,200	28,000	- 7,276
3	33,983		35,100	33,800	30,700	28,900	28,600	28,000	- 5,983
4	33,546		33,800	34,900	33,500	30,400	28,700	28,300	- 5,246
5	33,828		33,400	33,600	34,600	33,300	30,200	28,500	- 5,328
6	34,793		33,500	33,100	33,300	34,300	33,000	30,000	- 4,793
7	35,063	Projections[b]	33,400	32,100	31,700	31,900	33,000	31,700	- 3,363
8	35,786		34,300	32,700	31,400	31,000	31,300	32,200	- 3,586
9	29,203		28,100	27,100	25,800	24,800	24,700	24,900	- 4,303
10	27,899		27,900	26,700	25,800	24,600	23,600	23,600	- 4,299
11	27,806		26,500	26,300	25,300	24,400	23,300	22,400	- 5,406
12	26,929		26,700	25,400	25,300	24,400	23,500	22,400	- 4,529
Postgrad.	181		200	200	200	200	200	200	+ 19
Sp. Ed. Elem.	6,070		6,100	6,000	5,800	5,700	5,500	5,300	- 770
Sp. Ed. Sec.	2,579		2,600	2,600	2,500	2,500	2,400	2,300	- 279
TOTAL	416,703		406,900	395,500	385,000	374,900	366,900	360,100	- 56,603

[a] Our Schools Today, Nonpublic Elementary and Secondary School Report 1977-78, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p.17.

[b] Projections: Selected Educational Statistics for Pennsylvania to 1987-88, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, pp.8,9.

Table 6

Nonpublic Classroom Teachers by Grade Level

	1977-78[a]		1978-79	1979-80	1980-81	1981-82	1982-83	1983-84	Enrollment Decrease/ Increase 1977-83
K	855	Projections[b]	891	923	931	945	995	1,023	168
1	1,588		1,448	1,366	1,349	1,327	1,321	1,367	- 221
2	1,603		1,552	1,408	1,331	1,314	1,293	1,288	- 315
3	1,545		1,602	1,543	1,303	1,323	1,312	1,282	- 263
4	1,525		1,543	1,593	1,531	1,391	1,317	1,298	- 226
5	1,538		1,523	1,534	1,581	1,523	1,384	1,307	- 231
6	1,581		1,530	1,512	1,522	1,568	1,509	1,376	- 205
7	1,594		1,525	1,466	1,449	1,559	1,515	1,453	- 141
8	1,628		1,566	1,493	1,435	1,419	1,434	1,476	- 152
9	1,902		1,836	1,772	1,692	1,625	1,620	1,634	- 269
10	1,818		1,825	1,746	1,686	1,613	1,548	1,549	- 269
11	1,811		1,733	1,720	1,656	1,600	1,529	1,481	- 350
12	1,753		1,746	1,662	1,660	1,599	1,542	1,461	- 292
Sp. Ed. Elem.	607		610	600	580	570	550	530	- 77
Sp. Ed. Sec.	258		260	260	250	250	240	230	- 28
Total	21,606		21,190	20,598	19,956	19,626	19,109	18,755	-2,851
% Change			1.9	2.8	3.1	1.7	2.7	1.9	

[a] Nonpublic teachers for 1977-78 were derived by dividing enrollments by the following student-classroom teacher ratios: elementary 21.99; secondary 15.35; and 10.0 for special education. Basic data were from two Pennsylvania Department of Education statistical reports: Nonpublic Elementary and Secondary School Report 1977-78, and Projections: Selected Educational Statistics for Pennsylvania to 1987-88.

[b] Classroom teachers in the projections are distributed using the same proportion as found for 1977-78.

Table 7

Teacher Demand, Elementary and Secondary Schools in Pennsylvania

(Public Schools)
Part I

Year	Enrollment K-12[a] Elementary	Secondary	Total	Classroom Teachers[a]	Teacher Increase/ Decrease	Replacement Needs[b]	Total Demand[c]
	(1)	(2)	(3)	(4)	(5)	(6)	(7)
1970-71	1,264,247[1]	1,099,570	2,363,817	108,772[b]	2,668	13,025	15,693
1971-72	1,248,839	1,121,826	2,370,665	109,035	263	11,488	11,751
1972-73	1,224,959	1,136,326	2,361,285	111,682	2,647	10,562	13,209
1973-74	1,183,777	1,137,660	2,321,437	113,089	1,407	10,467	11,874
1974-75	1,149,633	1,127,818	2,277,451	115,668	2,579	9,275	11,854
1975-76	1,129,451	1,116,696	2,246,147	116,255	587	8,344	8,931
1976-77	1,093,578	1,100,095	2,193,673	114,425	-1,830	8,483	6,653
1977-78	1,054,040	1,074,833	2,128,873	112,956	-1,469	7,923	6,454
		Projections					
1978-79	1,012,100	1,045,900	2,058,000	110,900	-2,056	7,763	5,707
1979-80	976,100	1,011,200	1,987,300	108,900	-2,000	7,623	5,623
1980-81	944,600	976,800	1,921,400	107,500	-1,400	7,525	6,125
1981-82	913,400	942,600	1,856,000	106,400	-1,100	7,448	6,348
1982-83	884,400	914,900	1,799,300	103,800	-2,600	7,266	4,666
1983-84	863,100	890,200	1,753,300	101,100	-2,700	7,077	4,377
			(Nonpublic Schools) Part II				
1970-71	387,478	129,673	517,151	21,018	312	2,516	2,828
1971-72	360,553	126,274	486,827	21,134	-116	2,225	2,109
1972-73	334,165	121,937	456,102	20,838	-296	1,969	1,673
1973-74	321,056	122,939	443,995	20,277	-561	1,876	1,315
1974-75	310,669	122,723	433,392	20,973	696	1,680	2,376
1975-76	306,037	121,932	427,969	20,972	- 1	1,504	1,503
1976-77	302,387	121,667	424,054	20,901	- 71	1,553	1,482
1977-78	296,973	119,730	416,703	21,591	690	1,652	2,342
		Projections					
1978-79	289,600	117,300	406,900	21,192[d]	-399	1,604	1,205
1979-80	282,100	113,400	395,500	20,598	-594	1,559	965
1980-81	275,100	109,900	385,000	20,052	-546	1,518	972
1981-82	269,100	105,800	374,900	19,526	-526	1,478	952
1982-83	264,100	102,800	366,900	19,109	-417	1,447	1,030
1983-84	259,300	100,800	360,100	18,755	-354	1,420	1,066

[a] Projections, Selected Educational Statistics for Pennsylvania to 1987-88, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978.

[b] Our Schools Today, Professional Personnel Report 1970-78, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978.

[c] Demand equal column 5 plus column 6.

[d] Student-classroom teacher ratios for 1977-78 of 19.2 are assumed to continue through 1983-84 for purpose of projecting nonpublic teachers in this column.

Table 8

Distribution of Teacher Personnel in Pennsylvania by Position and Age, 1977-78[a]

	Total	Under 20	Per-cent	20-24	Per-cent	25-29	Per-cent	30-34	Per-cent
Nursery School	127			4	3.1	38	3.0	24	18.9
Kindergarten	2,527			83	3.3	657	26.0	458	18.1
Elementary	46,479	11	0.02	1,408	3.0	12,637	27.2	10,822	23.3
Secondary	51,126	15	0.03	1,440	2.8	9,997	19.6	12,425	24.3
Elementary/Secondary Comb.	2,495	1	0.04	124	5.0	754	30.2	602	24.1
Special Education	7,898	3	0.04	591	7.5	3,166	40.1	1,661	21.0
Speech	1,213	1	0.08	120	9.9	561	46.2	241	19.9
Head of Department	1,091					15	1.4	117	10.7
Total	112,956	31	0.03	3,770	3.3	27,825	24.6	26,350	23.3

35-39	Per	40-44	Per-cent	45-49	Per-cent	50-54	Per-cent	55-59	Per-cent	60-64	Per-cent	65 Over	Per-cent
20	15.7	8	6.3	9	7.1	10	7.9	5	3.9	4	3.1	5	3.9
249	9.9	273	10.8	253	10.0	211	8.3	167	6.6	159	6.3	17	0.7
5,697	12.3	3,992	8.6	3,838	8.3	3,147	6.8	2,498	5.4	2,067	4.4	362	0.8
7,877	15.4	5,393	10.5	4,627	9.1	4,136	8.1	3,201	6.3	1,741	3.4	274	0.5
298	11.9	201	8.1	189	7.6	145	5.8	121	4.8	54	2.2	6	0.2
706	8.9	434	5.5	418	5.3	359	4.5	288	3.6	217	2.7	55	0.7
102	8.4	69	5.7	48	4.0	37	3.1	17	1.4	15	1.2	2	0.2
162	14.8	146	13.4	200	18.3	190	17.4	152	13.9	91	8.3	18	1.6
15,111	13.4	10,516	9.3	9,582	8.5	8,235	7.3	6,449	5.7	4,348	3.8	739	0.7

[a]Our Schools Today, Professional Personnel Report 1977-78, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p.19.

Table 9

Reasons for Withdrawal from Teaching in Pennsylvania Public Schools 1970-1977[a]

Year	Attend College	Better Salary	Death	Enrollment Decrease	Illness	Marriage[b]	Maternity	Not Suited to Teach	Replace Sub by Teacher	Retirement	Teaching Conditions	Other Reasons	Out-of-State	Left PA. Schools[c] TOTAL
1970-71	791	347	247	32	259	2,274	2,120	254	295	2,899	69	2,703	735	13,025
1971-72	500	294	241	58	183	1,835	1,693	209	339	3,265	24	2,314	529	11,468
1972-73	440	325	200	34	151	1,755	1,289	184	284	3,328	13	2,018	541	10,562
1973-74	399	292	243	76	157	1,713	1,109	144	408	3,069	15	2,298	547	10,467
1974-75	329	276	212	72	129	1,421	998	125	431	2,685	18	2,130	449	9,275
1975-76	220	175	220	259	132	1,085	887	104	495	2,425	11	2,027	304	8,344
1976-77	232	206	184	398	133	914	956	81	613	2,444	14	2,035	273	8,483
1977-78	219	236	204	258	138	966	905	126	620	2,187	13	1,786	265	7,923
Mean	391	269	219	148	160	1,495	1,245	153	436	2,788	22	2,164	455	9,943

[a]Our Schools Today, Professional Personnel Report, series 1970-1977, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education.

[b]Combined categories: marriage and husband transfer.

[c]Total includes out-of-state transfers, not in-state transfers. Also, not included are teaching positions eliminated due to cuts in programs. (715 positions were eliminated in 1977-78 due to cuts in programs.)

TEACHER SUPPLY

Annual teacher supply in the Commonwealth derives principally from some 84 higher education institutions which prepare teachers, but includes those returning to teaching and teachers from out of state as well. This section first looks at those initially prepared each year and then at other sources of teachers.

During the 1960s the increasing demand for teachers, coupled with rising teacher salaries, resulted in ever increasing enrollments in teacher preparation programs.

Richard Freeman, in The Market for College Trained Manpower, Harvard Press, 1971, indicated that "increased wages attract students to a field and add to the supply of specialists several years later, lags in supply being primarily due to the lengths of educational programs."

Annual teacher supply in Pennsylvania rapidly overcame the lags in terms of teacher demand. Annual teacher supply in terms of initial certification rose from 12,354 in 1965 to a peak of 19,453 in 1971-72, then it declined to 11,769 by 1976-77, or a supply level slightly below that of 1965 (Table 10).

Table 10 shows that students and educators took some, but insufficient, note of falling teacher demand in the 1970s. The greatest imbalance in annual teacher supply and teacher demand came in 1972 and 1977 when the supply exceeded the demand by 40.4 and 44.7 percent respectively. Unless there is some change in the projections for teachers between 1978 and 1984, the average annual oversupply for these years will be 52.4 percent.

Table 10

Teacher Demand Compared with Initial Teacher Supply

Year	Pennsylvania Teacher Demand[a]	Pennsylvania Teacher Supply[b]	Demand as Percent of Supply	Excess Teachers	Percent Supply Exceeds Demand
1970-71	18,521	18,102	102.3	- 419	- 2.3
1971-72	13,860	19,453	71.2	5,593	40.4
1972-73	14,882	18,881	78.8	3,999	26.9
1973-74	13,189	17,944	73.5	4,755	36.1
1974-75	14,230	15,267	93.2	1,037	7.3
1975-76	10,434	13,152	79.3	2,718	26.1
1976-77	8,135	11,769	69.1	3,634	44.7
	Projections				
1977-78	8,796	11,100	79.2	2,304	26.2
1978-79	6,912	10,800	64.0	3,888	56.3
1979-80	6,588	10,600	62.2	4,012	60.9
1980-81	7,097	10,400	68.2	3,303	46.5
1981-82	7,300	10,200	71.2	2,900	39.7
1982-83	5,696	10,000	57.0	4,304	75.6
1983-84	5,443	9,800	55.5	4,357	80.0

[a] From Tables 7, Part I and II, public and nonpublic schools.

[b] From Table 11.

Sources of Teacher Supply in Pennsylvania

Table 11 shows the number of teachers produced or projected by each of Pennsylvania's four higher education segments between 1971 and 1984.

Examination of Table 11 reveals that between 1971 and 1977 the state-owned institutions produced twice as many teachers as the 66 private institutions which prepare teachers, and more than double the number prepared by the state-related institutions.

Highlights from Table 11 showing the drop in teacher supply by institutional segment between 1971-77 and 1977-84 follow:

Teacher Supply by Institutional Segment

Institutional Segment	Total Teacher Supply 1971-77	1978-84	Average Annual Supply 1971-77	1978-84	Percent 1971-77	1978-84
State-Owned	61,802	39,600	8,829	5,657	53.9	54.3
Private	30,846	17,900	4,407	2,557	26.9	24.6
State-Related	20,245	15,400	2,892	2,200	17.7	21.1
State-Aided	1,675	-	239	-	1.5	-
Total	114,568	72,900	16,371	10,414	100.0	100.0

Between 1971 and 1977, according to Table 11, the state-related segment's proportion of all teachers prepared in Pennsylvania increased by 1.2 percent, while at the same time teacher preparation declined at state-owned and state-aided institutions by 0.6 and 0,9 percent, and no change occurred at private institutions.

Elementary, Secondary and Special Education Teacher Supply

Table 12 shows the actual elementary, secondary and special education teachers supplied by institutional segment between 1971 and 1977, and projects this supply for 1983. Highlights from Table 12 show that by 1984 teacher supply from this source will decrease by more than 50 percent for elementary and secondary teachers, but may increase by 125 percent for special education teachers.

Teacher Supply from Pa. Higher Education Institutions

Years	Elementary	Secondary	Special Education
1970-76	-46.1	-41.6	172.3
1970-83	-54.4	-51.7	125.4

Table 11

Teacher Supply in Pennsylvania by Higher Education Segment

Year	All Segments	Teacher Supply: State-Owned	State-Related	Private	State-Aided	Percent of Supply: State-Owned	State-Related	Private	State-Aided	Percent of Change: State-Owned	State-Related	Private	State-Aided	All Segments
1970-71	18,102[a]	9,855	3,255	4,645	347	54.4	18.0	25.7	0.2	3.7	23.8	- 0.8	20.5	5.8
1971-72	19,453	10,019	3,859	5,252	323	51.5	19.8	27.0	1.7	1.7	18.6	13.1	- 6.9	7.5
1972-73	18,881	10,225	3,204	5,163	289	54.1	17.0	27.3	1.5	2.1	- 1.7	- 1.7	-10.5	2.9
1973-74	17,944	9,935	3,013	4,791	205	55.4	16.8	26.7	1.1	- 2.8	- 6.0	- 7.2	-29.1	5.0
1974-75	15,267	8,419	2,404	4,234	210	55.1	15.8	27.7	1.4	-15.3	-20.2	-11.6	2.4	14.9
1975-76	13,152	7,005	2,247	3,731	169	53.3	17.1	28.4	1.3	-16.8	- 6.5	-11.9	-19.5	13.9
1976-77	11,796	6,344	2,263	3,030	132	53.8	19.2	25.7	1.1	- 9.4	0.7	-18.8	-21.9	10.3
Mean	16,371	8,829	2,892	4,407	239	53.9	17.7	26.9	1.5	53.9	17.7	26.9	1.5	100.0
	Projections[b]													
1977-78	11,100	6,000	2,300	2,800	-*	54.1	20.7	25.2	- *					
1978-79	10,800	5,800	2,300	2,700	-	53.7	21.3	25.0	-	3.3	0.0	3.6	-*	- 2.7
1979-80	10,600	5,700	2,300	2,600	-	53.8	21.7	24.5	-	1.7	0.0	3.7	-	- 1.9
1980-81	10,400	5,700	2,200	2,500	-	54.8	21.2	24.0	-	0.0	4.4	3.9	-	- 1.9
1981-82	10,200	5,600	2,100	2,500	-	54.9	20.6	24.5	-	1.8	4.6	0.0	-	- 1.9
1982-83	10,000	5,500	2,100	2,400	-	55.0	21.0	24.0	-	1.8	0.0	4.0	-	2.0
1983-84	9,800	5,300	2,100	2,400	-	54.1	21.4	24.5	-	3.6	0.0	0.0	-	2.0
Mean	10,414	5,657	2,200	2,557	-	54.3	21.1	24.6	-	54.3	21.1	24.6	-	100.0

[a] Our Colleges and Universities Today, Preparation and Occupational Pursuits of Elementary, Secondary and Special Education Teachers, 1976-77, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p.4.

[b] Projections, Selected Education Statistics for Pennsylvania to 1987-88, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, pp.18-19.

* State-Aided included with private.

Table 12

Annual Initial Teacher Supply from Pennsylvania Higher Education
Categories by Elementary, Secondary and Special Education

Institutions	Total	Supply			Percent		
		Elem.	Sec.	Sp.Ed.	Elem.	Sec.	Sp.Ed.
1970-71							
All Institutions	18,102[a]	7,462	9,930	710	41.2	54.9	3.9
State-Owned	9,855	4,167	5,188	500	42.3	52.6	5.1
State-Related	3,255	1,295	1,830	130	39.8	56.2	4.0
Private[c]	4,992	2,000	2,912	80	40.1	58.3	1.6
1976-77							
All Institutions	11,769	4,019	5,817	1,933	34.2	49.4	16.4
State-Owned	6,344	2,117	3,039	1,188	33.4	47.9	18.7
State-Related	2,263	772	1,033	458	34.1	45.7	20.2
Private	3,162	1,130	1,745	287	35.7	55.2	9.1
Projections[b]							
1983-84							
All Institutions	9,800	3,400	4,800	1,600	34.7	49.0	16.3
State-Owned	5,300	1,800	2,600	900	34.0	49.1	17.0
State-Related	2,100	700	1,000	400	33.3	47.6	19.1
Private	2,400	900	1,200	300	37.5	50.0	12.5

[a]Our Colleges and Universities Today, The Preparation and Occupational Pursuits of Elementary, Secondary and Special Education Teachers 1976-77, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p.4.

[b]Projections, Selected Educational Statistics for Pennsylvania Institutions to 1987-88, p. 19.

[c]Includes private state-aided institutions.

Bachelor's Graduates and Graduates Initially Certified

Table 13 compares annual bachelor's graduates with those receiving initial teacher certification from 1971 to 1977. In all major segments there has been a considerable drop in teachers produced as a percent of bachelor's graduates.

Table 13

Initial Teacher Supply Versus Bachelor's Degree Graduates

Year	Total Bachelor's Graduates[a]				Total Teachers Produced[b]				Teachers as % of Bachelor's Grads.			
	State-Owned	State-Related	Private	State-Aided	State-Owned	State-Related	Private	State-Aided	State-Owned	State-Related	Private	State-Aided
1970-71	12,590	12,856	20,753	3,823	9,855	3,255	4,645	347	78.3	25.3	22.4	9.1
1971-72	13,175	13,947	21,471	4,070	10,019	3,859	5,252	323	76.1	27.7	24.5	7.9
1972-73	14,459	15,298	22,336	4,151	10,225	3,204	5,163	289	70.7	20.9	23.1	7.0
1973-74	15,151	15,072	22,617	4,154	[illegible]5	3,013	4,791	205	65.6	20.0	21.2	4.9
1974-75	14,204	14,966	22,137	4,366	8,41[illegible]	2,404	4,234	210	59.3	16.1	19.1	4.8
1975-76	13,302	15,276	21,833	4,212	7,005	2,247	3,731	169	52.7	14.7	17.1	4.0
1976-77	13,016	15,270	21,368	4,166	6,344	2,263	3,030	132	48.7	14.8	14.2	3.2

[a] Our Colleges and Universities Today, Degrees and Other Formal Awards Conferred by Pennsylvania Institutions of Higher Education 1976-77, Division of Education Statistics, Bureau of Information Systems, Pennsylvania Department of Education, 1978, p. 3.

[b] Our Colleges and Universities Today, The Preparation and Occupational Pursuits of Elementary, Secondary and Special Education Teachers 1976-77, p. 4.

Teacher Supply from Out of State

Even with the great competition for teaching jobs, some school districts hire teachers from other states. This includes some Pennsylvania residents prepared to be teachers by out-of-state colleges.

In a survey of first-year teachers, 2,003 usable responses were received, of these 137, or 6.8 percent, were from other states. Assuming that this rate of hiring of out-of-state first-year teachers applies to the total beginning teachers in the fall of 1976, the number would be 462, or less than one per school district.

The Teacher Supply Reservoir

The initial certificate issued to those prepared to teach is Instructional I. Typically in any one year more Instructional I certificates are issued than there are teacher education graduates in Pennsylvania that year. This is due to inmigration, to students in fields other than education, and to students who after their baccalaureate degrees take just enough courswork to qualify for the initial certificate.

Of the 6,534 education majors responding to a 1974 PDE postgraduation survey, 2,083 (31.9 percent) took nonteaching jobs. Assuming that similar proportions have continued to exercise nonteaching options, this would mitigate somewhat a continuing oversupply of teachers. Still, some of these certified teachers who are underemployed may enter teaching at a later time. In a follow-up of the baccalaureate class of 1974 two and one-half years later, the proportion of education majors who became teachers increased approximately eight percent.

Follow-up studies of college graduates in 1974, 1975, 1976 and 1977 by the Pennsylvania Department of Education indicate that initial employment of teacher education graduates include some 50 nonteaching occupations. About nine percent take jobs in clerical work, four percent in managerial occupations, three percent in sales, three percent in service occupations, and five percent accept employment as laborers (including factory work). Many of these kinds of people would enter teaching if they could.

Do Teacher Education Graduates Find Jobs in Pennsylvania?

The 1977 follow-up study of college graduates by the Pennsylvania Department of Education indicated that the employment status of teacher education graduates by degree levels was as follows approximately five months after graduation.

	% Employed in Field Prepared		% Employed in Other Field		Total % Employed	
	In Pa.	Outside Pa.	In Pa.	Outside Pa.	In Pa.	Outside Pa.
Baccalaureate	34.6	13.6	13.7	3.0	48.3	16.6
Master's	67.8	9.6	5.6	1.0	73.4	10.6
Doctoral	64.0	14.3	14.9	0.6	78.9	14.9

RELATIONSHIP OF TEACHER DEMAND AND SUPPLY IN PENNSYLVANIA

Ideally, a relative balance between teacher demand and teacher supply would be beneficial both to teacher-preparing institutions and their graduates. Teachers would be able to use their specialization and would not feel forced into nonteaching jobs. They would feel that they were getting full value from their college education both in special accomplishment and financial remuneration.

In a marketplace economy in a free society, imbalance in teacher demand and supply is almost assured. The goal should be to keep the imbalance small enough to promote the efficient use of human and economic resources.

Richard Freeman, in the Over-Educated American, summarizes the teacher demand and supply conditions in these words:

> As for the future the market situation is likely to remain grim for at least a decade. Even with rapid declines in the number of education graduates, the continued fall in demand and the large supply of experienced teaching personnel can be expected to produce a weak job market.

Teacher Demand Versus Supply in Pennsylvania

Getting into the specifics of teacher demand and supply in Pennsylvania, one finds a continuing imbalance that is not promising for graduates in teacher education. In Table 10, for instance, supply is projected to exceed the demand for teachers by 55 percent over the next seven years.

Teacher Demand and Supply by General Subject in Pennsylvania, 1977

Table 14 contains data on total teaching staff and hiring demands for new teacher replacements. This table serves to give general rather than specific insight into the demand picture due to the general nature of the categories and the slightly different time periods when the data were collected. It should be realized, also, that demand for new teachers is reduced annually to the extent that returnees to teaching (those inactive for a year or more) are hired.

A Final Thought

The teacher demand and supply projections reported in this study are, of course, subject to change due to new factors that cannot be readily anticipated. For example, the publication of this report itself may affect teacher supply in the future by further reducing the number of students choosing education as their major. This would then reduce the projected imbalance between demand and supply.

Therefore, the present study suggests the need for periodic monitoring of the demand/supply picture for teachers.

Table 14

Public School Hiring Demand by Subject Areas, 1976-77

		Total Teachers in These Fields	New Positions[a]	Replacements	Total Positions Filled	New Initially Certified Graduates	Teacher Surplus/ Need[b]
TOTAL		93,260	1,167	4,273	5,440	11,227	5,787
ELEMENTARY	Total	34,019	183	1,432	1,615	4,019	2,404
SECONDARY	Total	51,408	421	2,202	2,623	5,275[c]	2,652
Business Education		3,121	22	157	179	238	59
Distributive Education		209	8	15	23	0	-23
English		7,755	33	384	417	527	110
Foreign Languages	Total	(2,731)	(16)	(154)	(170)	(343)	(173)
French		878	4	60	64	112	48
German		468	5	27	32	62	30
Latin		172	1	9	10	12	2
Spanish		1,213	6	58	64	157	93
Home Economics		2,474	15	191	206	330	124
Industrial Arts		1,506	28	94	122	240	118
Mathematics		3,389	53	240	293	348	55
Music		4,187	25	223	248	635	387
Physical & Health Education		6,354	60	207	267	1,177	910
Sciences	Total	(5,734)	(35)	(220)	(255)	(440)	(185)
Biology		1,616	9	52	61	254	193
Chemistry		882	3	40	43	51	8
Earth & Space Science		669	8	35	43	64	21
General Science		2,142	14	73	87	50	-37
Physics		425	1	20	21	21	0
Social Studies		3,070	32	192	224	833	609
Speech & Dramatic Arts		114	-	8	8	50	42
Trade, Industrial, Voc., Tech.		2,299	94	117	211	114	-97
SPECIAL EDUCATION		7,833	563	639	1,202	1,933	731

[a] Figures in this column do not necessarily reflect an increase statewide in the total number of teaching positions.

[b] Negative numbers in parentheses indicate a deficit of teachers.

[c] 542 initially certified secondary teachers (art 431, agriculture 28, Russian 7, other 76) not entered due to absence of corresponding data in columns "new positions" and replacements.

Table 15

Resident Live Births in Pennsylvania, 1916-78

Year	Live Births	Annual Change	Year	Live Births	Annual Change
1916	217,449		1948	247,227	-21,286
1917	222,505	5,056	1949	224,581	- 2,646
1918	220,170	- 2,335	1950	221,635	- 2,946
1919	207,685	-12,485	1951	235,074	13,439
1920	220,462	12,777	1952	239,964	4,890
1921	229,452	8,990	1953	239,206	- 758
1922	214,348	-15,104	1954	245,521	6,315
1923	217,235	2,887	1955	242,591	- 2,930
1924	223,103	5,868	1956	248,019	5,428
1925	215,120	- 7,983	1957	254,997	6,978
1926	207,696	- 7,424	1958	249,810	- 5,187
1927	210,001	2,305	1959	246,615	- 3,195
1928	200,769	- 9,232	1960	241,099	- 5,516
1929	189,524	-11,245	1961	240,172	- 927
1930	189,458	66	1962	226,393	-13,779
1931	178,714	-10,744	1963	221,537	- 4,856
1932	168,534	-10,180	1964	218,515	- 3,022
1933	157,046	-11,488	1965	204,105	-14,410
1934	160,238	3,192	1966	195,869	- 8,236
1935	161,166	928	1967	188,706	- 7,163
1936	159,393	- 1,773	1968	185,729	- 2,977
1937	161,133	1,740	1969	185,046	- 683
1938	165,708	4,575	1970	192,154	7,108
1939	160,774	- 4,934	1971	180,939	-11,215
1940	165,456	4,682	1972	163,110	-17,829
1941	174,193	8,737	1973	153,272	- 9,838
1942	197,177	22,984	1974	151,458	- 1,814
1943	199,366	2,189	1975	148,942	- 2,516
1944	178,370	-20,996	1976	148,004	- 938
1945	173,799	- 4,571	1977	153,415	5,411
1946	218,376	44,577	1978 (Proj t'd)	155,065	1,650
1947	248,513	30,137			